

### **REMARKS**

Applicant thanks the Examiner for consideration of the Application. Claims 1-4, 8-14, 20, 21, 23, 25-33, 35 are under consideration, while claims 5-7, 15-19, 22, 24, and 34 are withdrawn from consideration. Applicant believes that the Examiner probably meant to have claims 20 and 35 withdrawn as well, as they are dependant on a withdrawn claim. Upon the allowance of a generic claim, Applicant is entitled to consideration of claims to additional specifics written in dependent form or otherwise including all of the limitations of an allowed generic claim. Claim 20 was objected to and the remainder of the claims were rejected. Claim 8 has been amended to correct an error in the original language (output is to pass through at least n-1 filters, not n filters). Claims 11-14, 20, and 25 have been amended to address the Examiner's concerns.

#### **Rejections under 35 U.S.C. Section 112:**

Claims 11-14 have been amended to more particularly point out and distinctly claim the subject matter set forth therein. Claim 20 has been amended to put the claim in proper form. Claim 25 has been amended to more particularly point out and distinctly claim the subject matter set forth therein.

#### **Rejections under 35 U.S.C. Section 102:**

Claims 8-11, 21, 23, 33, and 35 were rejected under Section 102(e) as anticipated by U.S. Pat. No. 6,431,309 to Coffin (hereinafter "Coffin"). The independent claims will be discussed primarily, as the dependant claims are more narrow in scope and are therefore patentable under the cited code section for at least the reasons that the base claim is patentable thereunder in each instance.

As a preliminary matter, Applicant respectfully asserts that the Examiner has misinterpreted Coffin. First, although Coffin describes the primary 2 and secondary speaker cone 4 as "pneumatically coupled" (col. 2, lines 58-60), this usage of "pneumatic" appears to be non-standard. In particular, Coffin indicates that a rigid link 11 couples the primary and secondary speaker cones together (col. 2, lines 53-57). Because the speaker cones are rigidly coupled

together, this would effectively short circuit any pneumatic coupling. Accordingly, the secondary speaker cone cannot passively radiate, since it is actively driven by the voice coil bobbin 8, through the rigid link.

Additional support to the above interpretation is provided by the teachings of Coffin regarding the resulting structure of FIG. 1 as having three controllable variables: the volumes (air masses) of sub-chamber 27, sub-chamber 23 and port 26 (col. 3, lines 15-29). Similarly, with respect to FIG. 6, Coffin describes the controllable variables as the volumes of the ported sub-chambers 75, 77 and 78, and air masses in ports 76A, 76B, and 76C. No mention at all is made of the air mass of the orifice 14. Were the orifice 14 configured as a passive radiator coupling two sub-chambers (e.g. 23 and 27 of FIG. 1; 75 and 78 of FIG. 6), as asserted by the Examiner, the acoustic mass of this purported passive radiator would be an important design variable of the system. Coffin, however, fails to make any mention of the orifice 14 as serving the function of a passive radiator or describe any of the characteristics thereof. Furthermore, were air coupling to occur under the interpretation proposed, air communication would occur not only through the aperture but also through the air gap of the voice coil structure. As those of skill in the art know, clearances are as tight as possible there to maximize electrical interaction and to prevent all but a miniscule airflow through the gap. Accordingly, one of skill in the art would be motivated to minimize any air mass presented by the orifice, consequently eliminating any possibility of the disclosed structure functioning as a passive acoustic radiator.

Secondly, several typographical errors in the disclosure of Coffin may have resulted in confusion as to what sub-chambers the various speaker surfaces are coupled to. In particular, the Examiner appears to have relied on a typographical error in Coffin where the incorrect reference designator “78” (col. 5, line 3) is used rather than the correct reference “77” to refer to the “front sub-chamber” (col. 4, line 67). In fact, a careful reading shows that Coffin teaches that output from the front side of the primary speaker 2 is always coupled to the chamber (or exterior air) directly in front of the primary speaker (see FIG. 1, col. 3, lines 18-24; FIG. 2, col. 3, lines 30-34, 44-47; FIG. 3, col. 3, lines 54-58, col. 3, line 67 – col. 4, line 3; FIG. 4, col. 4, lines 9-12, 21-24 (noting reference “5” should be “4”), FIG. 5, col. 4, lines 42-47, FIG. 6, col. 4, line 66 – col. 5, line 4 (noting reference “77” should be “78”). Consequently, Coffin does not teach coupling

output from the front side of the primary speaker through the central or rear subchambers as asserted by the Examiner. Accordingly, as Coffin discloses no effective air pathway through the structure to interconnect all three chambers, it is physical impossible to achieve a third-order bandpass characteristic. Furthermore, the teaching of the reference that the diaphragms move together independently makes achieving a filter effect impossible.

Now, with respect to the present application, Applicant respectfully submits that all elements of the combination of claim 8 are not taught or suggested by Coffin. In particular, Coffin fails to disclose either the secondary passive acoustic radiator or the interaction of subchamber compliances wherein the output of the transducer and the primary passive acoustic radiator pass through at least  $n-1$  of the acoustic filters as claimed. As discussed above, the combination of speaker cones 2 and 4 of Coffin does not function as a secondary passive acoustic radiator as claimed in claim 8. Furthermore, the structure of Coffin fails to filter the output of both the transducer and a primary passive acoustic radiator through at least  $n-1$  Helmholtz-reflex acoustic filters before exiting the enclosure as claimed in claim 8.

Similarly, with respect to claim 10, Coffin fails to teach the first passive radiator as claimed or achieve three spaced frequencies frequencies in the passband of the loudspeaker system at which the deflection characteristic of the diaphragm has a minimum as claimed.

With regard to claims 21, 23 and 33, for at least the reason that there is no possibility of effective coupling of chambers through the transducer in Coffin as clarified arified above, there is also no possibility of a third-order acoustic low pass characteristic being created by the structure of Coffin in any of the examples given therein. In contrast, claims 21, 23 and 33 include the step of “configuring said low range speaker system to include multiple, lowpass acoustic filter structures to achieve at least a third order acoustic low pass characteristic.”

For at least these reasons all the elements of the combination of claims 8, 10, 21, 23, and 33 are not disclosed in the reference, and it does not anticipate these claims.

Remaining claims 9, 11-14, 25-32 and 35 being dependant on these independent claims are patentable for at least the above reasons, they being more narrow than those claims discussed above.

**Rejections under 35 U.S.C. Section 103:**

Claim 1 stands rejected under Section 103(a) as unpatentable over Coffin and the Examiners assertion of what would have been “obvious to try”. Applicant respectfully traverses this rejection and the examiners official notice. Coffin fails to disclose achieving three Helmholtz-reflex tunings as discussed in detail above. Accordingly, Coffin fails to teach forming a third Helmholtz-reflex tuning as claimed. Furthermore, having failed to teach forming a third Helmholtz-reflex tuning, there is no suggestion or motivation to modify Coffin to tune a non-existent third resonance. Accordingly, it would not be obvious to one of skill in the art to dimension the third passive acoustic radiator to form a third Helmholtz-reflex tuning at a frequency lower than that of the first and second passive acoustic radiators, since there is no third Helmholtz-reflex tuning in the structure disclosed by Coffin. Accordingly, Applicant respectfully submits that claim 1 is allowable for at least this reason.

Claims 2-4, being dependent from claim 1 are similarly allowable for at least this reason.

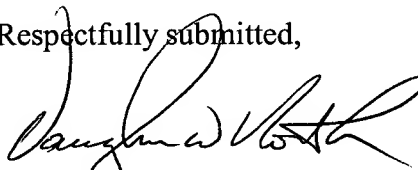
## CONCLUSION

The rejections of the independent claims should be reconsidered in light of the foregoing. The dependant claims are patentable for at least the reasons their base claims are patentable, so those rejections should be reconsidered as well. Applicant prays said reconsideration be carried out and the rejections be withdrawn. If any question regarding the foregoing remains after review of the facts and reconsideration of the merits of the application the Examiner is encouraged to contact the undersigned to expeditiously further prosecution of the application to issuance.

The Commissioner is hereby authorized to charge any additional fee or to credit any overpayment in connection with this Amendment to Deposit Account No. 20-0100.

DATED this 17<sup>th</sup> day of October, 2005.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Vaughn W. North", written in a cursive style.

Vaughn W. North  
Registration No. 27,930

THORPE NORTH & WESTERN, LLP  
Customer No. 20,551  
P.O. Box 1219  
Sandy, Utah 84091-1219  
Telephone: (801) 566-6633